

PHY 122.69 (Physics for Life Sciences II)

Spring 2023 Syllabus

Prerequisites: C or higher in PHY 121

Requisites: CHE 132 or CHE 152

Credits: 4 (including the lab course)

Description: Second part of an introduction to physics with applications to biology, primarily for students majoring in biological sciences or pre-clinical programs. Topics include electromagnetism, optics, acoustics, and radiation phenomena. Strong algebra skills and knowledge of the ideas of calculus are required. Three lecture hours and two laboratory hours per week. PHY 122 may not be taken for credit in addition to PHY 127, 132, or 142. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Stony Brook Curriculum Learning Objectives: Studying the Natural World (SNW) - this course will teach students the basics of optics, acoustics, electromagnetism and radiation, providing the tools to interpret physical phenomena happening in nature and in everyday's life in a more quantitative way, and developing some of the critical thinking needed to decompose more complex problems into a set of more basic steps. This course also includes a lab section, where students will learn how to run experiments, analyze data and write-up their findings into a scientific report.

Lecture days/time: This course of PHY 122, Section 69, Physics for the Life Sciences II will have lectures delivered in an online, asynchronous format. The lectures will become available around 2:00 pm on the scheduled date. Please note that due to current University policy, the testing procedure and grading criteria are not the same as PHY122.01 during Spring 2023, and are different from the criteria used in PHY121.69 during Fall 2022.

Material: This course will cover Chapters 17-30 of the electronic textbook described below.

Exams: Two midterm exams will be given on February 23rd from 8:15 pm to 9:35 pm and March 30th from 8:15 pm to 9:35 pm, and a final exam will be given on May 11th from 11:15 am to 1:45 pm. The registrar's policy is that students are responsible for avoiding exam conflicts, and exceptions will not be granted in this course. The exams will become available at the scheduled times, and are due at the end of the period. Late exams will not be accepted. This class is taught in an on-line and an in-person format covering the same material, but with different grading criteria and testing formats.

Instructors

- Prof. Clark McGrew <clark.mcgrew@stonybrook.edu>
- Prof. Giacinto Piacquadio <giacinto.piacquadio@stonybrook.edu>
- Prof. Radu Ionas (laboratory) <radu.ionas@stonybrook.edu>
- Office hours for the lecture instructors will be held online through the ZOOM link in the combined course blackboard page (PHY122.00), or, by appointment, in our offices. The instructors will also be available in the help-room (see the help-room schedule).

Blackboard

Most of the course administration will be done via Blackboard. For the on-line course, there are 3 separate Blackboard pages that you will have to access:

- PHY122.00 to access section-independent information, such as the homework, the course calendar, recorded lectures and lecture notes, and the zoom link for the TA and Professors' office hours
- PHY122.69 to access section-specific information, such as clicker question scores (more below), on-line midterms, and exam-scores.
- A lab course blackboard run by Prof. Radu Ionas

Please make sure that you have access to your Stony Brook Blackboard account, that these courses are listed there (in 1st week of classes for sure), and that the email address listed in your Blackboard account is one that you monitor. You have to register for the mastering physics homework and access clicker questions via Blackboard; see below.

Calendar

The calendar shows the material that will be covered in each lecture.

Firsts for this Semester:

- First *Clickers* for credit (clicker must be registered in Blackboard): **1/31**
- First *Homework* for class due (submitted online): **01/31**
- First *Pre-Lecture Homework* due (submitted online): **1/31 before 11:30 am**
- First week of *Lab Sessions*: **1/30**
- First day the Help Room is staffed: **1/30**

Format of course

Class Lectures will provide an introduction to the material, problem solving practice, and short answer questions to allow you (and the instructor) to ascertain your understanding of the material just after it is presented. You should prepare for the lectures by reading the corresponding section of the e-text, and completing the pre-lecture homework assignment.

Lectures are recorded on Tuesday and Thursday mornings, and are available for viewing anytime after they are recorded on the course blackboard page.

Please be sure to view the lecture prior to the homework deadline each week.

Required Homework problems will be assigned using an online system called *Mastering Physics*. Additional information is given in the Homework section below.

You should plan to use a calculator for the lectures. It should be able to do trig functions, square root, log, exponential notation. You do not need a fancy graphing calculator. You will also need your calculator for the exams. Your calculator is an important tool for the course, and you should be familiar with it. Calculators may not be shared in the exams. You may not use the calculator function of a mobile phone in the exams.

There are no recitations. The lecture functions as a recitation, insofar as you are guided towards learning how to solve problems on the material in the lecture notes and in the homework problems

Laboratory

The laboratory is mandatory. There are ten lab experiments during the semester. All lab grades count; none are dropped. If you have an excused absence for missing your lab, the due date will be extended

A lab write up that completes all of the items listed in the manual for each individual lab is due one week from the date of each lab. More information about the format and grading of the lab reports will be given by your laboratory instructor.

All students are required to complete all 10 labs. Any student missing three labs (and not completing a make up) will have the letter grade for PHY 122 dropped by one letter! Any student missing four or more in-lab sessions will have the letter grade dropped by two letters! This has happened to students in previous semesters, so please make sure this does not happen to you.

“Clicker Questions”

During lecture, there will be several clicker and short answer questions. When these occur, you should pause the lecture and attempt the problems yourself. The answers to each question should then be entered into the corresponding “clicker quiz” on blackboard to register your answers.

Homework and Electronic Textbook (etext)

Homework problems will be assigned using an online system called Mastering Physics (see below). There is a link on the course blackboard page through which you access and register for Mastering Physics. There will be two sets of online problems assigned for each lecture. The

pre-lecture problems count as extra credit, should take 15 to 20 minutes and must be completed before the lecture starts. The post-lecture problems are expected to take about 60 minutes. The post-lecture problems are due a few days after the lecture, so please check Mastering Physics for details. An additional adaptive problem set may be assigned based on the answers given to the post-lecture problems. The adaptive problems are triggered by wrong answers given during the main problem set, and allow you to make up for wrong answers provided during the set.

Problem solving is an important skill to be learned, and can only be learned by doing. We recognize that solutions to many of the homework problems can be on-line, but since the homework scores count for a significant part of the grade and you are expected to solve them independently. While you should solve the individual homework problems independently, working with your peers is a powerful way to enhance your understanding and is strongly encouraged.

Mastering Physics and Electronic Textbook: You must have a Mastering Physics license for the course (a license is good for two semesters!). This is obtained via the blackboard link for the course. **Detailed instructions can be found in the “Documents” section of the PHY122.00 course.** This semester, we will primarily be following “College Physics, a Strategic Approach”, 4th edition, by Knight, Jones, and Field.

Getting help

To help you with questions related to your homework problems and the laboratory, a help-room will be available (Physics A-132 and online through ZOOM). The zoom link can be found on the PHY122.00 Blackboard, and the schedule will be posted before the 2nd week of classes.

Exams

Two midterm exams and a **final exam** will be given. See the dates at the top of the syllabus. You have to make sure there are no conflicts in your schedule – we will not grant makeup exams. The registrar's policy is that students are responsible for avoiding exam conflicts, and exceptions to the University policy will not be granted in this course. To pass the course, you must have a score for at least one of the two midterms and the final exam. If you cannot take a midterm due to exceptional circumstances (documented illness, death in the immediate family, etc), discuss this with the instructor as soon as possible. We will increase the weights of the other parts of the course accordingly, but not have make-up exams. If you miss the final, or more than one midterm, with a valid excuse, you will receive an Incomplete in the course and you must contact the instructors to schedule an exam as promptly as possible after the end of the semester. Taking at least two exams is required to pass the course. The exams are scheduled by the registrar during the common exam periods for PHY122. Unlike past semesters, the in-person and on-line sections will have different exams. The online section will have exams given online and be proctored using Respondus. The exams must be taken during the scheduled exam period to minimize the possibility of communication between students. You will need to provide a College Board approved calculator and a sheet of handwritten notes.

Please note: The on-line exams may only be taken during the scheduled time slot (in the eastern time zone). Make absolutely sure that you are available during the scheduled slots. The only exceptions will be for specific, pre-approved accommodations determined by the University.

Grades

Your final grade will be based on the following.

- 25% Homework
- 10% Clicker score
- 12.5% **Each** of two midterms
- 25% Labs
- 15% Final Exam

Notes:

- The clicker score grade is based on providing a correct answer while you watch the video.

Standard University Policy

A. Student Accessibility Support Services (SASC): If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website:

<https://ehs.stonybrook.edu//programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities> and search Fire Safety and Evacuation and Disabilities.

B. Academic Integrity: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic

integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

C. Critical Incident Management: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Until/unless the [latest COVID guidance](#) is explicitly amended by SBU, during Fall 2021 "disruptive behavior" will include refusal to wear a mask during classes. For the latest COVID guidance, please refer to: <https://www.stonybrook.edu/commcms/strongertogether/latest.php>

D. Student Participation in University-Sponsored Activities: Students may have to miss class as a result of their participation in an event or activity sponsored by the University. This course will operate in compliance with the University policy set forth at: https://www.stonybrook.edu/sb/bulletin/current/policiesandregulations/policies_expectations/participation_univponsored_activities.php. In particular, you should notify us in advance, but definitely before the final date of the 'add/drop' period, of your intention to miss any class, exams, or labs that will arise due to such activities. At that time, we can discuss how you will be able to secure the work covered.

E. Religious Holidays: This course will operate in compliance with the University's policy regarding religious holidays, set forth at: http://www.stonybrook.edu/commcms/provost/faculty/handbook/employment/religious_holidays_policy.php. In particular, you should notify us in advance, but definitely before the final date of the 'add/drop' period, of your intention to be out for religious observance. At that time, we can discuss how you will be able to secure the work covered.

VIII. Some Important Tips for Success:

- Physics depends heavily on mathematics. At this level, you'll need working familiarity with trigonometry and algebra, and a preparation to understand the ideas of calculus. So it is very important for your success that you meet the course prerequisites. Actually, calculus was invented to solve physics problems, and so we hope this course helps you understand some of the math you may have struggled to see the point of.
- Be familiar with your calculator, and use the same one for exams and the lab that you use for homework. You don't want to be spending valuable exam time figuring out how to use your calculator!
- Keep up to date with the material. The class has to move fast to cover everything, and most material builds on earlier topics.
- Read the book along with the lectures, and turn in as many of the homework.
- University guidelines state: "Students are expected to be 'on task' for 40-45 clock hours per credit, per semester. 'On task' pertains to all instructional activities

(exams, homework, lectures, discussions, etc.)” That works out to ten to twelve hours per week for this four-credit course.

- Do the homework! Don't just use Chegg, Google, Bing, Course Hero, etc. to look up the answer. It may be a quick way to finish the assignment, but it won't nourish your understanding, and it really won't help you to retain the concepts. Most of our exam problems are going to be very similar to the homework and the survey questions. If you've only looked at them before, you're in trouble. If you've solved them before, you're prepared.
- Most of the course administration will be done via Blackboard. Please make sure that you have access to your Stony Brook Blackboard account, that this course is listed there, and that the email address listed in your Blackboard account is one that you monitor. The detailed course calendar, and lots of other useful information is available in Blackboard
- We encourage you to visit us in our on-line office hours, email us with questions, and visit the on-line Help Room!